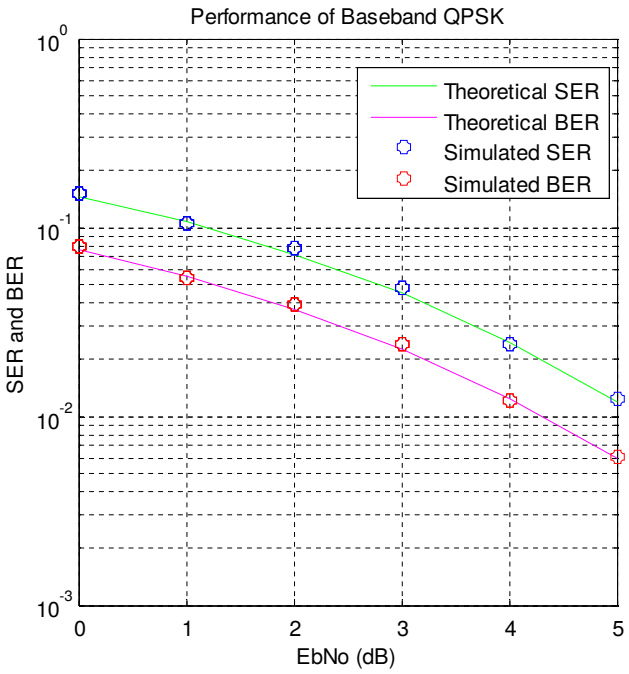
Project Two Description

Project purposes

1. Study BPSK, QPSK, 16QAM modulation/demodulation
2. Study the situation where there is no ISI. Investigate Raised Cosine filter
3. Study the eye diagram and constellation
4. Transmit the real image over AWGN channel – Note that you would need to modify the picture on the course site, this picture is currently saved as a –gif because this is the only way that it can be uploaded on the course room. Please save your image on your desktop as a bmp. Before doing that modify the scale of the image to grey by copy and saving it to windows paintbrush program. Save it as 24 bitmap image on the windows paintbrush program.
5. Investigate the impact on timing errors

Project steps:

1. Copy the files from the web as example.
2. Generate BMP file with 512 by 512, 8 bits.
3. Task 1: Design your own modulation and demodulation models.
4. Task 2 (1 point): Show the time signal, eye diagram, and constellation for no noise, SNR=0dB, SNR =5dB, and SNR=10DB.
5. Task 3: (4/2+2): Calculate the BER vs. SNR curves for BPSK. Compared with theoretical curve. For graduate students, calculate additional curves for QPSK and MQAM



6. Task 4 (3 Points): Transmit images
    a. Test small image first

   b. Alignment for both timing and data
   c. PSNR vs. SNR curves
   d. Print images for SNR = 0dB, SNR =2.5dB, SNR=5 dB
7. Task 5 (2 Points): Timing errors
   a. 1/16, 2/16, then what is BER vs. SNR, and what is PSNR vs. SNR